through activities undertaken for S&T awareness creation and popularization, entrepreneurship development, bio-technology applications, natural resource data management micro hydel and targeted S&T based interventions for weaker sections, women, scheduled castes and tribes etc.

(b) and (c) Does not arise.

Prediction of monsoon and drought situation

1771. SHRI TARIQ ANWAR: Will the Minister of SCIENCE AND TECHNOLOGY be pleased to state:

(a) whether it is a fact that Meteorological Department is not well-equipped to predict the arrival of Monsoon or the drought situation;

(b) if so, the details thereof; and

(c) the steps taken by Government to improve the Meteorological Department?

THE MiNISTER OF STATE OF THE MINISTRY OF SCIENCE AND TECHNOLOGY (SHRI KAPIL SIBAL): (a) and (b) No, Sir. IMD is fairly equipped to predict the arrival of monsoon and also the quantum of rainfall expected during the season as a whole which include the probability of drought also. However, the intra-seasonal variability, both in space and time, is not well understood due to lack of high resolution numerical models, especially tuned to tropical weather condition and matching high resolution weather data.

(c) A comprehensive review of the infrastructure required for achieving high resolution weather forecast both, in time and space, was carried out. A proposal to upgrade technology for effecting improvement in observing, forecasting, product generation and dissemination system is being submitted for consideration by the Government.

Failure of Meteorological Department in prediction

1772. SHRI DATTA MEGHE: Will the Minister of SCIENCE AND TECHNOLOGY be pleased to state:

(a) whether it is a fact that Meteorological Department has badly failed in forecasting weather and its estimates have always been proving wrong;

(b) if so, the reasons therefor,

(c) whether any measures have been taken to ensure correct forecasts by the Meteorological Department; and

(d) if so, the details thereof?

THE MINISTER OF STATE OF THE MINISTRY OF SCIENCE AND TECHNOLOGY (SHRI KAPIL SIBAL): (a) No, Sir. IMD has been using 16-parameter Power Regression Model for issuing Long Range Forecast of total quantum of rainfall likely during the season as a whole since 1988. Its performance was seen to be satisfactory and was appreciated until 2002 when the model could not capture the large deficiency of rainfall.

(b) Monsoon is a complex phenomenon involving land, ocean and atmosphere. It originates as a result of series of energy exchanges occurring in the earth atmosphere system. Though attempts have been made over the year to unravel the mysteries of development and strengthening of monsoon, the complex interactions leading to energy exchange are not well understood. There is no technology anywhere in the world to give exact forecast of monsoon like systems.

(c) and (d) Attempts were made to refine and introduce a number of new models before commencement of 2003 monsoon. These models gave fairly accurate forecasts for the season and also for the month of July 2003. However, based on the same models, the forecasts for rainfall in July 2004 has not Materialized as the realised rainfall was 81% compared to 98+9% forecasted rainfall. Seasonal rainfall forecast is 100+4%. The performance for the season will be assessed after the season is over. IMD in collaboration with Indian Institute of Science, Bangalore has implemented a Numerical Weather Prediction (NWP) system for the seasonal prediction of monsoon rainfall. Currently the NWP system is in the experimental mode and some

more research work is necessary before it is made operational. In the meantime, IMD is working sincerely for the further improvement of the statistical models.

Cargo Traffic projected in Ninth Plan

1773. SHRIMATI PREMA CARIAPPA:
SHRI DHARAM PAL SABHARWAL:

Will the Minister of SHIPPING be pleased to state:

(a) the volume of cargo traffic projected during the terminal year of the Ninth Plan for various ports in the country;

(b) the achievements made during the said period by each port;

(c) the deficiencies notice, if any particularly due to lack of adequate draft in various ports;

(d) if so, the names of the hub ports of the neighbouring countries used for transhipment; and

(e) to what extent, such transhipment increased the shipping cost of Indian cargo?

THE MINISTER OF SHIPPING (SHRI T.R. BAALU): (a) and (b) The volume of Cargo Traffic projected during the terminal year of the Ninth Plan *i.e.* 2001-02 by the working group for the Port sector for the Plan and the achievements made during the said period by each of the Major Ports is given below:—

In million Tonnes

Name of the Port	Projections	Achievements
Kolkata	31.71	30.40
Paradip	33.46	21.13
Vishakhapatnam	45.01	44.34
Ennore	—	3.40